



ANTH 373: Psychoactive Substances in Ancient Societies

Instructor: Dr. Scott M. Fitzpatrick
E-mail: smfitzpa@uoregon.edu
Class Time: T/H (10:00 – 11:20 AM)
Classroom: 125 MCK
Office: Rm. 272, Condon Hall
Office Hours: T/H (1:30 – 2:30 PM)

GTF: Meagan Clark
Office Hours: T/H (8:40 – 9:40 AM)

Take me, I am the drug; take me, I am hallucinogenic. (Salvador Dali)

COURSE DESCRIPTION

Mind altering substances have been used by humans for thousands of years. But what are the causes behind why ancient societies have used, and even encouraged, the consumption of psychoactive substances? This course is an introduction to the archaeological study of how various stimulants, narcotics, and depressants have been used by human groups in antiquity. Using case studies from around the world, we will examine how archaeologists study the material evidence for psychoactive substance use, the role that psychotropics have played in social organization, religious ideologies, and inter-personal relationships, the identification of alkaloids and residues found on artifacts, and the impact that these substances have had on modern society. Archaeological, paleoenvironmental, paleoanthropological, and ethnohistorical research provides a framework for understanding why humans appear to have had a social and psychological need for mind-altering substances and the technologies they developed for harvesting, producing, and consuming drugs.

STUDENT LEARNING OUTCOMES

In this course students will:

- evaluate how archaeologists study psychoactive substances chemically, culturally, and theoretically;
- calculate how remains of psychoactive substances and associated artifacts help to understand past cultural behaviors (e.g., using residue analysis from ceramics to infer alcohol production);
- identify the techniques used to analyze the alkaloids and other active agents in psychoactive substances;
- explain how humans interact with, cultivate, and manipulate plants to harness psychoactive properties;
- outline the consequences of purifying and extracting psychoactive agents and the impacts of substance abuse on modern societies.

COURSE REQUIREMENTS

Class Discussion/Participation	= 50 points
Section Attendance/Participation	= 50 points
Midterm	= 100 points
Final	= 100 points
Research Paper (draft 1) - abstract, etc.	= 10 points
Research Paper (draft 2) - background	= 10 points
<u>Research Paper</u>	<u>= 80 points</u>
Total	= 400 points

REQUIRED COURSE READINGS: (see assigned readings for each week below)

- **Schultes, R. E., A. Hofmann, and C. Rätsch.** 2001. *Plants of the Gods: Their Sacred, Healing, and Hallucinogenic Powers.* Rochester, VT: Healing Arts Press.
- **Journal Articles** (see list under each weekly topic – note, only three (3) articles (**in bold**) apart from any assigned book chapters, are required. All others are optional and may prove useful as references for your research paper.

COURSE REQUIREMENTS

Class Attendance, Discussion, and Participation – Participation in class is an essential part of learning course content. A major aspect of participation is doing the assigned readings and being able to discuss them in class. This will comprise 12.5% of your grade.

Section Attendance, Discussion, and Participation – Participation in sections is mandatory and also an essential part of learning course content. The quality of class discussions and effort to contribute and complete in-class activities will comprise 12.5% of your grade.

Exams – Two (2) exams – a **Midterm** and **Final** – will test your knowledge of the topics discussed in lecture, course readings, and any films (100 points each). The final will be comprehensive, but include primarily material covered during the second half of the term.

Research Paper – A 12-14 page research paper will be due during the last week of class. The paper must consist of a pre-selected topic chosen at random (see last page of syllabus for more detailed instructions) and should include both internal and external readings. During the term, you will be required to turn in different sections of the paper to ensure that you have enough time to put together a well written and scholarly piece. The two drafts will be graded by the GTF, while the final research paper will be graded by your instructor.

Course Percentages as they relate to letter grades

A+	98-100	B+	88-89.9	C+	78-79.9	D+	68-69.9	F	59.9 and below
A	93-97.9	B	83-87.9	C	73-77.9	D	63-67.9		
A-	90-92.9	B-	80-82.9	C-	70-72.9	D-	60-62.9		

FIELD TRIPS

During the course of the term, we will be organizing several field trips to local businesses that produce or sell various forms of psychoactive substances and/or paraphernalia. Most of these will be scheduled during the regular class period when at all possible, and organized to allow transit time to and from the university. While these are not mandatory, attendance will be taken and used as a basis for extra credit at the end of class.

POLICY ISSUES

For every day an assignment or exercise is late, 10% will be deducted from your final score. This includes weekend days. I do not accept emailed assignments – you must provide a hard copy unless specifically stated otherwise.

Incompletes

In this course, an incomplete grade will be used in accordance with the official university grading policy, which can be found at http://registrar.uoregon.edu/incomplete_policy

Open Learning Environment

The intention and structure of university level courses are to provide open, thoughtful forums for a wide variety of topics. While discussing these topics, students shall not discriminate on the basis of “The University of Oregon affirms and actively promotes the right of all individuals to equal opportunity in education and employment at this institution without regard to race, color, sex, national origin, age, religion, marital status, disability, veteran status, sexual orientation, gender identity, gender expression, or any other consideration not directly and substantively related to effective performance. This policy implements all applicable federal, state, and local laws, regulations, and executive orders” as outlined in the handbook on the Office of Affirmative Action and Equal Opportunity. <http://aeo.uoregon.edu/AAEO%20Booklet%20Color.pdf>

Accessible Education

The University of Oregon is dedicated to the principles of equal opportunity in education and accepts diversity as an affirmation of individual identity within a welcoming community. Disability is recognized as an aspect of diversity integral to the university and to society. Please see the following link for more information: <http://aec.uoregon.edu/>

University Career Center

The Career Center exists to provide career and job search services and resources to UO students and alumni. Our mission is to help you develop long-term career goals and strategies, facilitate self-exploration and discovery, connect with potential employers, and empower and challenge you to fulfill your potential. We look forward to serving as your advocate as you pursue an inspired and fulfilling future. The UO Career Center is a part of the Division of Student Affairs and has offices in Hendricks Hall on the UO campus and in the White Stag Block at the University of Oregon in Portland. Please see the following link for more information: <http://career.uoregon.edu/>

Computer and Other Electronic Devices Policy

The use of laptops and other portable computer devices (e.g., phones, etc.) is prohibited in class. These are disruptive and prevent a favorable learning environment. Please be prepared to put these away and turn them off when class begins. If you require special accommodations relating to the use of laptops, please see me.

TOPICS and READINGS**Unit 1 (1/6 – 1/8) Psychoactive Substances with Ancient Traditions: Evolutionary and Sociocultural Perspectives**

Why do humans use psychoactive substances? What role do they play in social or religious activities? Why is the study of these types of substances important biologically, evolutionarily, anthropologically, and archaeologically?

“Plants of the Gods”: p. 1-30; 184-194

Nesse, R. M. and K. C. Berridge. 1997. Psychoactive Drug Use in Evolutionary Perspective. *Science* 278:63-66.

Saniotis, A. 2010. Evolutionary and Anthropological Approaches towards Understanding Human Need for Psychotropic and Mood Altering Substances. *Journal of Psychoactive Drugs* 42.4:477-484.

Wadley, G. and A. Martin. 2000. The Origins of Agriculture – a Biological Perspective and a New Hypothesis. *Journal of Australasian College of Nutritional and Environmental Medicine* 19(1):3-12.

Wickelgren, I. 1997. Getting the Brain's Attention. *Science* 278:35-37.

Aghajanian, G.K. and G.J. Marek. 1999. Serotonin and Hallucinogens. *Neuropsychopharmacology* 21:16S-23S.

Unit 2 (1/13 – 1/15) Evolutionary and Sociocultural Perspectives (cont.)

“Plants of the Gods”: p. 31-81

Sullivan, R. J. and E. H. Hagen. 2002. Psychotropic Substance-Seeking: Evolutionary Pathology or Adaptation? *Addiction* 97:389-400.

Báeza, H., Castro, M., M. A. Benavente, P. Kintz, V. Cirimele. 2000. Drugs in Prehistory: Chemical Analysis of Ancient Human Hair. *Forensic Science International* 108:173-179

Schultes, R. E. 1998. Antiquity and the Use of New World Hallucinogens. *The Heffter Review of Psychedelic Research* 1:1-7.

Abraham, H. D. et al. 1996. The Psychopharmacology of Hallucinogens. *Neuropsychopharmacology* 14(4):285-298.

Film: Hooked: Illegal Drugs and How They Got that Way

Unit 3

(1/20 – 1/22) Alcohol (ethanol) and Caffeine

For how long have humans produced alcoholic and caffeinated beverages? What are the different plants (e.g., grains, potatoes, fruits) used for fermentation or caffeine production? What roles did alcohol and caffeine play in the development of social organization?

Dudley, R. 2002. Fermenting Fruit and the Historical Ecology of Ethanol Ingestion: is Alcoholism in Modern Humans an Evolutionary Hangover? *Addiction* 97:381-388.

Joffe, A. H. 1998. Alcohol and Social Complexity in Ancient Western Asia. *Current Anthropology* 39(3):297-322.

Crown, P.L., T.E. Emerson, J. Gu, W.J. Hurst, T.R. Pauketat, and T. Ward. 2012. Ritual Black Drink Consumption at Cahokia. *Proceedings of the National Academy of Sciences* 109(35): 13944-13949.

Jiang, H-E., Y-B Zhang, X. Li, Y-F Yao, D. K. Ferguson, E.G. Lu, and C-S Li. 2009. Evidence for Early Viticulture in China: Proof of a Grapevine (*Vitis vinifera* L., Vitaceae) in the Yanghai Tombs, Xinjiang. *Journal of Archaeological Science* 36(7):1458-1465.

Guasch-Jané, M. R., C. Andrés-Lacueva, O. Jáuregui, and R. M. Lamuela-Raventós. 2006. First Evidence of White Wine in Ancient Egypt from Tutankhamun's Tomb. *Journal of Archaeological Science* 33(8):1075-1080.

Jennings, J., K. L. Antrobus, S. J. Atencio, E. Glavich, R. Johnson, G. Loffler, and C. Luu. 2005. Drinking Beer in a Blissful Mood?: Alcohol Production, Operational Chains, and Feasting in the Ancient World. *Current Anthropology* 46(2):275-303.

Smith, F. 2006. European Impressions of the Island Carib's Use of Alcohol in the Early Colonial Period. *Ethnohistory* 53(3):543-566.

Reber, E. A., and M.T. Kerr. 2012. The Persistence of Caffeine in Experimentally produced Black Drink residues. *Journal of Archaeological Science* 39(7): 2312-2319.

In Section: Turn in to GTF your Research Paper Title, Abstract, and Preliminary list of 7 references

Unit 4

(1/27 – 1/29) Tobacco (*Nicotiana* sp.) and Kava

Where did tobacco and betel nut originate and how have they been used ritually and socially? Where are these found and what effects do they have on the user that might be beneficial? Does environment play a role in the selection or potency of these substances?

Rafferty, S. M. 2006. Evidence of Early Tobacco in Northeastern North America? *Journal of Archaeological Science* 33:453-458.

Visser, E. P. 1994. Skeletal Evidence of Kava use in Prehistoric Fiji. *Journal of the Polynesian Society* 103(3):299-317.

Hocart, C.H., B. Fankhaud, and D. W. Buckle. 1993. Chemical Archaeology of Kava, a Potent Brew. *Rapid Communications in Mass Spectrometry* 7:219-224.

Rafferty, S. M. 2002. Identification of Nicotine by Gas Chromatography/Mass Spectroscopy Analysis of Smoking Pipe Residue. *Journal of Archaeological Science* 29:897-907.

von Gernet, A. (n.d.) *Origins of Nicotine Use and the Global Diffusion of Tobacco*. Nicotine and Public Health (Ch.1):3-15.

Unit 5

(2/3 – 2/5) Coca (*Erythroxylum Coca*) and Khat (*Celastrus edulis*)

Coca and khat have a long history of use in their respective regions, though the antiquity of each is only now being truly appreciated with advances in various analytical techniques which are able to identify the active compounds. How were they processed and are there any advantages to their use in particular environments?

Stolberg, V. B. 2011. The Use of Coca: Prehistory, History, and Ethnography. *Journal of Ethnicity in Substance Abuse* 10(2):126-146.

Buikstra. 2001. Coca Chewing in Prehistoric Coastal Peru: Dental Evidence. *American Journal of Physical Anthropology* 114:242-257.

Halbach, H. 1972. Medical Aspects of the Chewing of Khat Leaves. *Bulletin of the World Health Organization* 47:21-29.

Cartmell, L. W., A. C. Aufderheide, A. Springfield, C. Weems, and B. Arriaza. 1991. The Frequency and Antiquity of Prehistoric Coca-Leaf-Chewing Practices in Northern Chile: Radioimmunoassay of a Cocaine Metabolite in Human-Mummy Hair. *Latin American Antiquity* 2(3):260-268. Indriati, E. and J. E.

Cortella, A. R., M. L. Pochettino, A. Manzo, and G. Raviña. 2001. *Erythroxylum Coca*: Microscopical Identification in Powdered and Carbonized Archaeological Material. *Journal of Archaeological Science* 28:787-794.

Luqman, W. and T. S. Danowski. 1976. The Use of Khat (*Eduhis*) in Yemen: Social and Medical Observations. *Annals of Internal Medicine* 85:246-249.

Unit 6

(2/10 – 2/12) Opium and Iboga

These plants are sparse in the archaeological record, yet their entheogenic properties and modern uses suggest they were also known in the past much deeper in time than was once thought.

“Plants of the Gods”: p. 112-114; see index for Opium

Fernandez, J. W., and Fernandez, R. L. 2001. “Returning to the path”: The use of Iboga [ine] in an Equatorial African Ritual Context and the Binding of Time, Space, and Social Relationships. *The Alkaloids: Chemistry and Biology* 56:235-247.

Merlin, M. D. 2003. Archaeological Evidence for the Tradition of Psychoactive Plant Use in the Old World. *Economic Botany* 57(3):295-323.

Ciaraldi, M. 2000. Drug preparation in evidence? An unusual plant and bone assemblage from the Pompeian countryside, Italy. *Vegetation History and Archaeobotany* 9(2):91-98.

Litzinger, W.J. 1981. Ceramic Evidence for Prehistoric *Datura* Use in North America. *Journal of Ethnopharmacology* 4:57-74.

Midterm Exam (includes all previous lecture and reading material)

Unit 7

(2/17 – 2/19) Datura, Ephedra, and Ergot

What plants are included in the Solanaceae family? Are they all psychoactive? What are the effects of Ephedra and Ergot, and why are they important to understanding the role of psychoactives in ancient societies? What role does archaeology and ethnobotany play in developing theories of how societies became more complex?

“Plants of the Gods”: p. 102-111

Spanos, N.P. 1983. Ergotism and the Salem witch panic: a critical analysis and an alternative conceptualization. *Journal of the History of the Behavioral Sciences* 19: 358-369.

Lee, M. R. 2011. The history of Ephedra (*ma-huang*). *JR Coll Physicians Edinburgh* 41(1):78-84.

Lee, M.R. 2009. The History of Ergot of Rye (*Claviceps purpurea*) I: from antiquity to 1900. *JR Coll Physicians Edinburgh* 39: 179-84.

Smith, M. T., N. R. Couch, N. Gericke, and M. Hirst. 1996. Psychoactive Constituents of the Genus *Sceletium* N.E.Br. and other Mesembryanthemaceae: A Review. *Journal of Ethnopharmacology* 50:119-130.

Caporael, L.R. 1976. Ergotism: The Satan Loosed in Salem? *Science* 192:21-26.

Matossian, M. 1982. Ergot and the Salem Witchcraft Affair. *American Scientist* 70(4):355.

In Section: Turn in to GTF your revised Research Paper which includes *Intro* and *Background* sections

Unit 8

(2/24 – 2/26) Marijuana (*Cannabis* sp.)

Cannabis is one of the most commonly used substances in modern society. Where does it come from and what importance does it have in medicine and ritual in ancient times? What issues have arisen in recent years regarding the use of this substance both medicinally and socially? What are the effects of kava and how does this compare to other psychoactive agents? What does the passage of recent laws mean for the future of marijuana use?

“Plants of the Gods”: p. 92-101

Russo, E. B., H-E. Jiang, X. Li, A. Sutton, A. Carboni, F. Bianco, G. Mandolino, D. J. Potter, Y-X. Zhao, S. Bera, Y-B. Zhang, E-G. Lu, D. K. Ferguson, F. Hueber, L. C. Zhao, C-J. Liu, Y-F. Wang, and C-S. Li. 2008. Phytochemical and Genetic Analyses of Ancient *Cannabis* from Central Asia. *Journal of Experimental Botany* 59(15): 4171–4182.

Merzouki, A. and J. M. Mesa. 2002. Concerning Kif, a *Cannabis Sativa* L. Preparation Smoked in the Mountains of Northern Morocco. *Journal of Ethnopharmacology* 81:403-406.

Fleming, M. P. and R. C. Clarke. 1998. Physical Evidence for the Antiquity of *Cannabis sativa* L. (Cannabaceae). *Journal of the International Hemp Association* 5(2):80-92.

Mukherjee, A., S. C. Roy, S. De Bera, H-E. Jiang, X. Li, C-S. Li, and S. Bera. 2008. Results of Molecular Analysis of an Archaeological Hemp (*Cannabis sativa* L.) DNA Sample from North West China. *Genetic Resources and Crop Evolution* 55:481–485.

Anke, J. and I Ramzan. 2004. Pharmacokinetic and pharmacodynamic drug interactions with Kava (*Piper methysticum* Forst. f.). *Journal of Ethnopharmacology* 93:153-160.

Unit 9

(3/3 – 3/5) Ayahuasca and Cohoba/Yopo (*Anadenanthera* spp.); Betel Nut (*Areca catechu*)

Anadenanthera spp. were some of the most commonly used psychoactive substances in ancient South America. How were they used in conjunction with other plants? Betel nut is one of the most widely used psychoactives worldwide and still enjoys great popularity in Asia and the Pacific? What are the effects and possible medicinal uses?

“Plants of the Gods”: p. 116-139

Fitzpatrick, S. M. Q. Kaye, J. Feathers, J. A. Pavia, and K. M. Marsaglia. 2009. Evidence for Inter-Island Transport of Heirlooms: Luminescence Dating and Petrographic Analysis of Ceramic Inhaling Bowls from Carriacou, West Indies. *Journal of Archaeological Science* 36(3):596-606.

Knobloch, P.J. 2000. Wari Ritual Power at Conchopata: An Interpretation of *Anadenanthera colubrina* Iconography. *Latin American Antiquity* 11:387-402.

Oxenham, M. F, C. Locher, N. Lan Cuong, and N. Kim Thuy. 2002. Identification of *Areca catechu* (Betel Nut) Residues on the Dentitions of Bronze Age Inhabitants of Nui Nap, Northern Vietnam. *Journal of Archaeological Science* 29(9):909-915.

Zumbroich, T. J. 2007. The Origin and Diffusion of Betel chewing: a Synthesis of Evidence from South Asia, Southeast Asia and Beyond. *Electronic Journal of Indian Medicine* 1:63–116

- Brewer-Carias, C., and Steyermark, J. A. 1976. Hallucinogenic Snuff Drugs of the Yanomamo Caburiwe-Teri in the Cauaburi river, Brazil. *Economic Botany* 30(1):57-66
- Granier-Doyeux, M. 1965. Native Hallucinogenic Drugs Piptadenias (Anadenanthera). *Bulletin of Narcotics*.
- McKenna, D. 2004. Clinical Investigations of the Therapeutic Potential of Ayahuasca: Rationale and Regulatory Challenges. *Pharmacology and Therapeutics* 102:111-129.
- Niemeyer, H.M., V. Zapata, P. Cantillana, A. Missene, J. Aquilar and A. Torres. 2013. Computed tomography study of snuff tray from San Pedro de Atacama (Northern Chile). *Journal of Archaeological Science* 40:2036-2044.
- Fairbairn, A. and P. Swadling. 2008. Re-dating mid-Holocene Betelnut (*Areca catechu* L.) and other Plant use at Dongan, Papua New Guinea. *Radiocarbon* 47:377-382.
- Fitzpatrick, S.M., G. Nelson, and R. Reeves. 2003. The Prehistoric Chewing of Betel Nut (*Areca catechu*) in western Micronesia. *People and Culture in Oceania* 19:27-37.

Unit 10**(3/10 – 3/12) Hallucinogens: Mushrooms and Cacti**

What are the active principles in the major hallucinogens? What roles have they played in shamanistic and other ritualistic types of activities? How are these diverse plants globally distributed?

“Plants of the Gods”: p. 156-169

Guzmán, G. 2008. Hallucinogenic mushrooms in Mexico: An overview. *Economic Botany* 62:404-412.

Terry, M., K. L. Steelman, T. Guilderson, P. Dering, and M. W. Rowe. 2006. Lower Pecos and Coahuila Peyote: New Radiocarbon Dates. *Journal of Archaeological Science* (in press). Rios, M. D. 1993. Twenty-Five

Torres, C. M. 1995. Archaeological Evidence for the Antiquity of Psychoactive Plant Use in the Central Andes. *Annual from the Museum of Civilization, Rovereto*. 11:291-326. Years of Hallucinogenic Studies in Cross-Cultural Perspective. *Anthropology of Consciousness* 4(1):1-8.

El-Seedi, H. R., P. A. G. M., De Smet, O. Beck, G. Possnert, J. G. Bruhn. 2005. Prehistoric Peyote Use: Alkaloid Analysis and Radiocarbon Dating of Archaeological Specimens of *Lophophora* from Texas. *Journal of Ethnopharmacology* 101:2380242.

Akers, B.P., J. F. Ruiz, A. Piper, and C.A.P. Ruck. 2011. A Prehistoric Mural in Spain Depicting Neurotropic Psilocybe Mushrooms? *Economic Botany* 65(2):121-128.

De Feo, V. 2003. Ethnomedical Field Study in Northern Peruvian Andes with Particular Reference to Divination Practices. *Journal of Ethnopharmacology* 85:243-256.

Matsushima, Y., F. Eguchi, T. Kikukawa, and T. Matsuda. 2009. Historical Overview of Psychoactive Mushrooms. *Inflammation and Regeneration* 29:47-58.

Griffiths, R. R., W. A. Richards, U. McCann, and R. Jesse. 2006. Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance. *Psychopharmacology* 187(3):268-283.

Merlin, M. D. and J. W. Allen. 1993. Species identification and chemical analysis of psychoactive fungi in the Hawaiian Islands. *Journal of Ethnopharmacology* vol. 40:21-40.

Research Paper due (In section during last week of class)

Final Exam: 8:00 AM, Tuesday, March 17th

RESEARCH PAPER

A major requirement for this class is to write a research paper on a topic of your choosing. This could be a review of a particular substance, a comparison of several substances, a region which includes multiple substances, a specific civilization, or anything else related to psychoactive substances in prehistory. The requirements for this paper are as follows:

- I. Write a 12-14 page paper on a specified topic. The paper should be typed, double-spaced, with 1" margins on all sides, in Times New Roman font (length does not include references or figures)
- II. Organize your paper into the following sections:
 - a. Introduction - What is your topic? Why is it interesting? What is the relevance of your topic to understanding the cultural use of psychoactive agents in the past and present?
 - b. Background - Where is the agent(s)/substance(s) found? Who uses it and in what contexts?
 - c. Body of Paper - Explain the significance of the research. Discuss the evidence.
 - d. Discussion - Why is this research important? What are the implications for research within and outside of anthropology/archaeology?
 - e. Conclusions - Reiterate why this topic is interesting and relevant. Summarize your findings.
 - f. References Cited - list all of your references – be consistent!
- III. You must include at least 15 references for your paper. Four (4) of these can be from readings in class. References must be from reputable sources – No Internet sources or public/mass media sources are acceptable (e.g., *National Geographic*, newspaper, web pages, and especially not Wikipedia!). There is no set reference format, just be consistent.
- IV. You must include at least three figures. One of these should be a map that shows the location(s) of your research and distribution of your particular substance(s). Other figures might include an illustration or photograph of the substance(s) and an example of it being used or produced. Make sure to reference all of your figures.

The descriptions and the quality of work for your project will be evaluated based on the following considerations:

Exceptional – The work goes well beyond the task assigned. The final project is truly impressive, complete, and well-thought out. The scientific analysis is well motivated and is clearly supported by the data presented. Extensions or provocative new ideas are included. Reference material, where used, is extensive and appropriate.

Strong – The work in the final report fully engages the major scientific principles embodied in the topic. The material is complete and presented clearly. Data are sound and are well chosen or presented to convey information. The scientific analysis makes good use of the data presented. The report demonstrates a clear understanding of the fundamental issues of the topic(s) being explored. Reference material is appropriate for the topic being discussed.

Additional Categories: Average, Weak, Poor

Your research will be graded on accuracy (30 points), detail (30 points), and clarity of presentation (20 points), with 20 points already given for title/abstract/references submissions. Points will be deducted for deviating from the assigned format, grammatical or typographical errors, and poor writing in general.